

IN THE CLAIMS:

The following listing of claims will replace all prior versions, and listings, of the claims in the application:

1-8. (Cancelled)

9. (New) An apparatus comprising:

(a) a radio frequency tag including an integrated circuit package containing at least tag electronic circuitry, a tag power supply integrated with said tag electronic circuitry, and a tag antenna operatively coupled to the integrated circuit package;

(b) a magnetic material providing an article surveillance response in the presence of an interrogating field; and

(c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna, wherein the integrated circuit package comprises a semiconductor device containing the tag electronic circuitry and the tag power supply, and the tag antenna comprises an antenna element electrically connected to the semiconductor device, and wherein a further antenna element cooperates with the first-mentioned antenna element to form the tag antenna, the further antenna element comprising said magnetic material coated with an electrically conducting material.

10. (New) An apparatus comprising:

- (a) a radio frequency tag including an integrated circuit package containing at least tag electronic circuitry, a tag power supply integrated with said tag electronic circuitry, and a tag antenna operatively coupled to the integrated circuit package;
- (b) a magnetic material providing an article surveillance response in the presence of an interrogating field; and
- (c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna, wherein the integrated circuit package comprises a semiconductor device containing the tag electronic circuitry and the tag power supply, and the tag antenna comprises an antenna element electrically connected to the semiconductor device, and wherein the tag antenna comprises a patch antenna electrically connected to the semiconductor device, the patch antenna having a ground plane, wherein the patch antenna comprises said magnetic material coated with an electrically conducting material.

11. (New) An apparatus comprising:

(a) a radio frequency tag including an integrated circuit package containing at least tag electronic circuitry, a tag power supply integrated with said tag electronic circuitry, and a tag antenna operatively coupled to the integrated circuit package;

(b) a magnetic material providing an article surveillance response in the presence of an interrogating field; and

(c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna, wherein the integrated circuit package comprises a semiconductor device containing the tag electronic circuitry and the tag power supply, and the tag antenna comprises an antenna element electrically connected to the semiconductor device, wherein the tag antenna comprises a patch antenna formed by a dielectric sheet having a first side and a second side, a first electrically conducting material attached to the first side, and a second electrically conducting material attached to the second side, wherein the semiconductor device is electrically connected to the first electrically conducting material and the second electrically conducting material, and wherein the magnetic material is attached to the dielectric sheet.

12. (New) An apparatus comprising:

- (a) a radio frequency transponder including a transponder chip containing at least chip electronic circuitry and a chip power supply, and a transponder antenna connected to the transponder chip;
- (b) a magnetic material providing a response in the presence of an interrogating field; and
- (c) the radio frequency transponder communicating information by modulating reflectance characteristics of the transponder antenna, wherein the tag antenna comprises a patch antenna electrically connected to the transponder chip, the patch antenna having a ground plane, wherein the patch antenna comprises said magnetic material coated with an electrically conducting material.

13. (New) An apparatus comprising:

- (a) a radio frequency transponder including a transponder chip containing at least chip electronic circuitry and a chip power supply, and a transponder antenna connected to the transponder chip;
- (b) a magnetic material providing a response in the presence of an interrogating field; and
- (c) the radio frequency transponder communicating information by modulating reflectance characteristics of the transponder antenna, wherein the tag antenna comprises a patch antenna formed by a dielectric sheet having a first side, and a second side, a first electrically conducting material attached to the first side, and a second electrically conducting material attached to the second side, wherein the transponder chip is electrically connected to the first electrically conducting material and the second electrically conducting material, and wherein said magnetic material is attached to the dielectric sheet.

14. (New) An apparatus comprising:

- (a) a radio frequency tag including an integrated circuit semiconductor device containing at least tag electronic circuitry and a tag power supply, and a tag antenna connected to the semiconductor device;
- (b) a magnetic material providing a response in the presence of an interrogating field; and
- (c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna, wherein the tag antenna comprises an antenna element electrically connected to the semiconductor device, wherein a further antenna element cooperates with the first-mentioned antenna element to form the tag antenna, the further antenna element comprising said magnetic material coated with an electrically conducting material.

15. (New) An apparatus comprising:

- (a) a radio frequency tag including an integrated circuit semiconductor device containing at least tag electronic circuitry and a tag power supply, and a tag antenna connected to the semiconductor device;
- (b) a magnetic material providing a response in the presence of an interrogating field; and
- (c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna, wherein the tag antenna comprises a patch antenna formed by a dielectric sheet having a first side and a second side, a first electrically conducting material attached to the first side, and a second electrically conducting material attached to the second side, wherein the semiconductor device is electrically connected to the first electrically conducting material and the second electrically conducting material, and wherein said magnetic material is attached to the dielectric sheet.

16. (New) An apparatus comprising:

(a) a radio frequency tag including an integrated circuit package containing at least tag electronic circuitry and a tag power supply, and a tag antenna connected to the integrated circuit package;

(b) a magnetic material providing an article surveillance response in the presence of an interrogating field; and

(c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna, wherein the tag antenna comprises said magnetic material coated with an electrically conducting material.

17. (New) The apparatus of Claim 16, wherein the tag antenna comprises a patch antenna electrically connected to the integrated circuit package.

18. (New) The apparatus of Claim 17, wherein the patch antenna further comprises a ground plane.

19. (New) The apparatus of Claim 17, wherein the patch antenna comprises a dielectric sheet having a first side and a second side, a first electrically conducting material attached to the first side, and a second electrically conducting material attached to the second side, wherein the semiconductor device is electrically connected to the first electrically conducting material and the second electrically conducting material, and wherein the magnetic material is attached to the dielectric sheet.

20. (New) An apparatus comprising:

(a) a radio frequency transponder including an integrated circuit package containing at least transponder electronic circuitry and a transponder power supply, and a transponder antenna connected to the integrated circuit package;

(b) a magnetic material providing a response in the presence of an interrogating field; and

(c) the radio frequency transponder communicating information by modulating reflectance characteristics of the transponder antenna, wherein the transponder antenna comprises said magnetic material coated with an electrically conducting material.

21. (New) The apparatus of Claim 20, wherein the transponder antenna comprises a patch antenna electrically connected to the integrated circuit package.

22. (New) The apparatus of Claim 21, wherein the patch antenna further comprises a ground plane.

23. (New) The apparatus of Claim 21, wherein the patch antenna comprises a dielectric sheet having a first side and a second side, a first electrically conducting material attached to the first side, and a second electrically conducting material attached to the second side, wherein the semiconductor device is electrically connected to the first electrically conducting material and the second electrically conducting material, and wherein the magnetic material is attached to the dielectric sheet.

24. (New) An apparatus comprising:

- (a) a radio frequency tag including an integrated circuit package containing at least tag electronic circuitry, a tag power supply integrated with said tag electronic circuitry, and a tag antenna operatively coupled to the integrated circuit package;
- (b) a magnetic material providing an article surveillance response in the presence of an interrogating field; and
- (c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna.

25. (New) The apparatus of Claim 24, wherein the integrated circuit package comprises a semiconductor device containing the tag electronic circuitry and the tag power supply, and the tag antenna comprises an antenna element electrically connected to the semiconductor device.

26. (New) The apparatus of Claim 25, wherein the tag antenna comprises a patch antenna electrically connected to the semiconductor device, the patch antenna having a ground plane.

27. (New) The apparatus of Claim 24, wherein the tag antenna comprises an electrically conducting antenna element electrically connected to the integrated circuit package, wherein the tag antenna and the integrated circuit package are attached to a dielectric material and wherein the magnetic material is attached to the dielectric material.

28. (New) An apparatus comprising:

(a) a radio frequency transponder including a transponder chip containing at least chip electronic circuitry and a chip power supply, and a transponder antenna operatively coupled to the transponder chip;

(b) a magnetic material providing a response in the presence of an interrogating field; and

(c) the radio frequency transponder communicating information by modulating reflectance characteristics of the transponder antenna.

29. (New) The apparatus of Claim 28, wherein the transponder antenna comprises an antenna element electrically connected to the transponder chip.

30. (New) The apparatus of Claim 29, wherein the antenna element comprises said magnetic material coated with an electrically conducting material.

31. (New) The apparatus of Claim 28, wherein the tag antenna comprises a patch antenna electrically connected to the transponder chip, the patch antenna having a ground plane.

32. (New) The apparatus of Claim 28, wherein the transponder antenna comprises an electrically conducting antenna element electrically connected to the transponder chip, wherein the tag antenna and the integrated circuit package are attached to a dielectric material and wherein the magnetic material is attached to the dielectric material.

33. (New) An apparatus comprising:

- (a) a radio frequency tag including an integrated circuit semiconductor device containing at least tag electronic circuitry and a tag power supply, and a tag antenna connected to the semiconductor device;
- (b) a magnetic material providing a response in the presence of an interrogating field; and
- (c) the radio frequency tag communicating information by modulating reflectance characteristics of the tag antenna.

34. (New) The apparatus of Claim 33, wherein the tag antenna comprises an antenna element electrically connected to the semiconductor device.

35. (New) The apparatus of Claim 34, wherein a further antenna element cooperates with the first-mentioned antenna element to form the tag antenna, the further antenna element comprising said magnetic material coated with an electrically conducting material.

36. (New) The apparatus of Claim 33, wherein the tag antenna comprises a patch antenna electrically connected to the semiconductor device.

37. (New) The apparatus of Claim 33, wherein the tag antenna comprises an electrically conducting antenna element electrically connected to the semiconductor device, wherein the tag antenna and the semiconductor device are attached to a dielectric material and wherein the magnetic material is attached to the dielectric material.

38. (New) An apparatus, comprising:

a radio frequency (RF) transponder (tag), the RF tag comprising a tag antenna, tag electronics for storing information in a codable and recodable memory and for communicating information to a base station by modulating reflectance characteristics of the tag antenna, and a tag power supply; and

a non-linear magnetic material operably associated with said RF tag, the non-linear magnetic material generating a varying electronic article surveillance magnetic field when the non-linear magnetic material is in a magnetic field.

39. (New) The apparatus of Claim 38, wherein said magnetic field is sinusoidally varying with a frequency  $f_0$ , the electronic article surveillance magnetic field varying with a frequency having higher harmonics of  $f_0$ .

40. (New) The apparatus of Claim 38, wherein the tag antenna comprises the non-linear magnetic material.

41. (New) The apparatus of Claim 40, wherein the tag antenna comprises a first wire electrically connected to a semiconductor device incorporating the tag electronics.

42. (New) The apparatus of Claim 41, wherein the first wire comprises non-linear magnetic material.

43. (New) The apparatus of Claim 42, wherein the non-linear magnetic material is coated with an electrically conducting material.

44. (New) The apparatus of Claim 41, wherein a second wire cooperates with the first wire to form the tag antenna, the second wire comprising non-linear magnetic material.

45. (New) The apparatus of Claim 44, wherein the non-linear magnetic material is coated with an electrically conducting material.

46. (New) The apparatus of Claim 41, wherein the tag antenna comprises a patch antenna electrically connected to a semiconductor device incorporating the tag electronics, the patch antenna having a ground plane.

47. (New) The apparatus of Claim 46, wherein the non-linear magnetic material is coated with an electrically conducting material.

48. (New) The apparatus of Claim 38, wherein the tag antenna comprises a patch antenna formed by a dielectric sheet having a first side and a second side, a first electrically conducting material attached to the first side, and a second electrically conducting material attached to the second side, wherein a semiconductor device incorporating the tag electronics is electrically connected to the first electrically conducting material and the second electrically conducting material, and wherein the non-linear magnetic material is attached to the dielectric sheet.

49. (New) The apparatus of Claim 38, wherein the tag antenna comprises an electrically conducting wire antenna electrically connected to a semiconductor device incorporating the tag electronics, wherein the tag antenna and the semiconductor device are attached to a dielectric material and wherein the non-linear magnetic material is attached to the dielectric material.